

**In the Claims**

1-17. (canceled)

18. (currently amended) A nutraceutical composition comprising a glucosamine component base and at least one nutrient component; wherein the glucosamine component is in an effective amount such that, when administered to a mammal in an effective amount, the nutraceutical composition is effective to improve fertility.

19. (currently amended) The composition of claim 18 wherein the glucosamine component is selected from the group consisting of glucosamine sulphate, glucosamine sulfate di-potassium chloride ~~2KCL~~, glucosamine sulfate sodium chloride ~~NaCl~~, glucosamine hydrochloride, N-acetylglucosamine, poly-N-acetylglucosamine ~~Poly-Nag-glucosamine~~, and combinations thereof.

20. (original) The composition of claim 18 in a dosage form selected from the group consisting of solid dosage form, dry powder dosage form, liquid dosage form, and combinations thereof.

21. (original) The composition of claim 18 where in the mammal is selected from the group consisting of human, bovine, equine, caprine, ovine, and porcine.

22-45. (canceled)

46. (previously presented) The composition of claim 18, wherein the composition improves fertility by achieving treatment, repair, or increased production of gametocytes in the mammal.

47. (previously presented) The composition of claim 18, wherein the composition improves fertility by promoting gametogenesis in the mammal.

48. (previously presented) The composition of claim 18, wherein the composition is provided to the mammal as a daily dose, wherein the daily dose comprises from about 1 g to about 50 g of the glucosamine component.

49. (previously presented) The composition of claim 48, wherein the mammal is a horse or other large mammal and wherein the daily dose comprises approximately 20 g of the glucosamine component.

50. (previously presented) The composition of claim 18 further comprising a nutrient component.

51. (previously presented) The composition of claim 50, wherein the nutrient component is selected from the group consisting of an oil cake component, an acid component, a mineral component, a vitamin component, a functional food component, and combinations of these.

52. (currently amended) The composition of claim 51, wherein the oil cake component is selected from the group consisting of soybean ~~flour~~flower, linseed oil cake, cottonseed oil cake, peanut oil cake, safflower oil cake, coconut oil cake, palm oil

cake, sesame oil cake, sunflower oil cake, rapeseed oil cake, kapok oil cake, mustard seed oil cake, and combinations thereof.

53. (currently amended) The composition of claim 51, wherein said acid component is ascorbic acid, ~~and at least one derivative thereof, lipoic acid, or dihydrolipoic acid; wherein the derivative is selected from the group consisting of magnesium ascorbyl phosphate, sodium ascorbyl phosphate, sodium ascorbate, ascorbyl glucoside, and combinations thereof.~~

54. (previously presented) The composition of claim 51, wherein said mineral component further comprises at least one mineral selected from the group consisting of zinc, boron, chromium, manganese, and combinations thereof.

55. (previously presented) The composition of claim 51, wherein said mineral acid component is further characterized as an amino acid chelate.

56. (previously presented) The composition of claim 51, wherein said vitamin component further comprises at least one vitamin selected from the group consisting of biotin, thiamine HCL, folic acid, and combinations thereof.

57. (previously presented) The composition of claim 51, wherein said functional food component further comprises an ingredient selected from the group consisting of prebiotic, probiotic, synbiotic and combinations of these.

58. (currently amended) The composition of claim 51, wherein the selected nutrient component[[s]] are is present in the following approximate effective proportions:  
between about 50 and about 200 pbw oil cake,

between about 400 to 750 pbw glucosamine component,  
between about 50 and about 150 pbw acid component,  
between about 0.0001 and about 1 pbw mineral component,  
between about 0.0001 about 1 pbw vitamin component, and  
between about 0.0001 and about 1 pbw of functional food component.

59. (previously presented) The composition of claim 51, wherein the nutrient component comprises nutrients selected from the group consisting of N-acetyl-D-glucosamine, glutamine, arginine, and combinations of these.

60. (previously presented) The composition of claim 50, wherein the nutrient component comprises between about 50 and about 200 pbw oil cake, between about 400 to 750 pbw glucosamine component, between about 50 and about 150 pbw acid component, between about 0.0001 and about 1 pbw mineral component, between about 0.0001 about 1 pbw vitamin component, and between about 0.0001 and about 1 pbw of functional food component.

61. (previously presented) The composition of claim 50, wherein the glucosamine component is from about 400 to about 700 pbw of the composition and wherein the nutrient component is from about 1 to about 600 pbw of the composition.

62. (previously presented) The composition of claim 61, further comprising a filler.

63. (new) The composition of claim 53, wherein the derivative is selected from the group consisting of magnesium ascorbyl phosphate, sodium ascorbyl phosphate, sodium ascorbate, ascorbyl glucoside, and combinations thereof.

64. (new) A nutraceutical composition comprising a glucosamine component and at least one nutrient component; wherein the glucosamine component and the at least one nutrient component are in an effective proportion and an effective amount such that, when administered to a mammal, the nutraceutical composition is effective to improve fertility.

65. (new) The composition of claim 64, wherein the glucosamine component is selected from the group consisting of glucosamine sulphate, glucosamine sulfate di-potassium chloride, glucosamine sulfate sodium chloride, glucosamine hydrochloride, N-acetylglucosamine, poly-N-acetylglucosamine, and combinations thereof.

66. (previously presented) The composition of claim 64, wherein the glucosamine component is from about 400 to about 700 pbw of the composition and whereing the nutrient component is from about 1 to about 600 pbw of the composition.

67. (new) The composition of claim 64, wherein the at least one nutrient component is selected from the group consisting of an oil cake component, an acid component, a mineral component, a vitamin component, a functional food component, and combinations of these.

68. (new) The composition of claim 64, wherein the at least one nutrient component comprises between about 50 and about 200 pbw oil cake, between about 400 to 750 pbw glucosamine component, between about 50 and about 150 pbw acid component, between about 0.0001 and about 1 pbw mineral component, between about 0.0001 about 1 pbw vitamin component, and between about 0.0001 and about 1 pbw of functional food component.

69. (new) A nutraceutical composition comprising a glucosamine component and at least two nutrient components selected from a group consisting of an oil cake component, an acid component, a mineral component, a vitamin component, and a functional food component; wherein the glucosamine component and the at least two nutrient components are in effective proportion and effective amount such that, when administered to a mammal, the nutraceutical composition is effective to improve fertility.